

April 30, 1940.

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2,198,783

PIPE CLEANING TOOL HEAD AND HANDLE

Original Filed Oct. 31, 1936

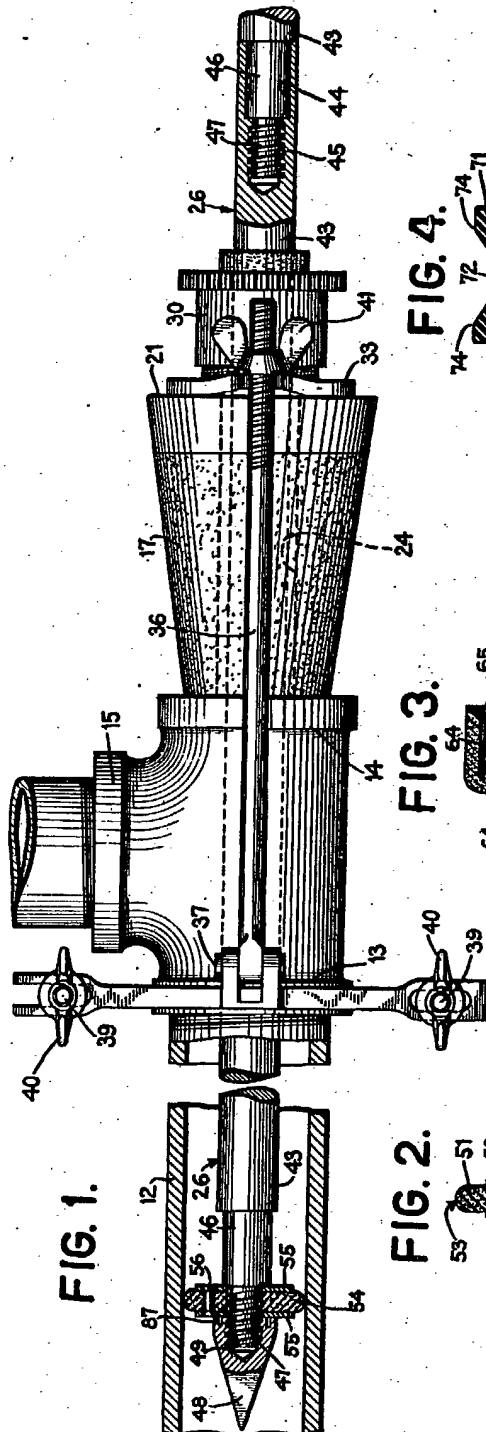


FIG. 1.

FIG. 4.

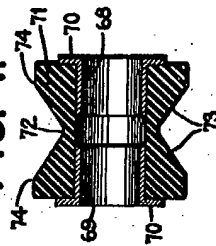


FIG. 3.

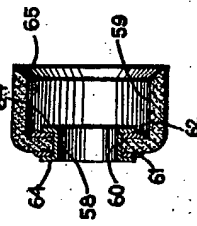


FIG. 2.

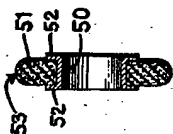


FIG. 8.

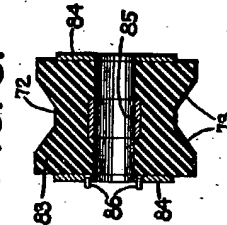


FIG. 7.

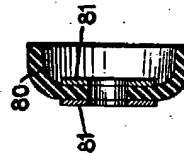


FIG. 6.

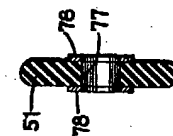
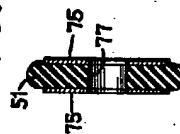


FIG. 5.



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2,198,783

PIPE CLEANING TOOL HEAD AND HANDLE

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Original application October 31, 1936, Serial No. 108,607. Divided and this application May 20, 1937, Serial No. 143,737

2 Claims. (Cl. 15-104.05)

This invention relates to devices for cleaning out the service pipe which runs from a gas main in the street into the building. Such a service pipe is generally three-quarter inch to three inches in diameter and runs from a T connected at the upper surface of the gas main to a T within the cellar for connection with the gas meter. This pipe is usually straight and slopes toward the main but frequently has a valve in it outside of the building, say at the curb line.

Service pipes of this character frequently become clogged from rust and corrosion and the tar deposited by the gas. Sometimes also water condenses in the pipe and collects in the bottom. Such water may freeze in winter and completely or substantially close the pipe for almost its entire length. Sometimes the gas company does not have a record of the location of the main.

The primary object of the present invention is a device which may be operated from the interior of the building to clean out obstructions and remove foreign matter from the interior of the service line.

Another object of the invention is a cleaning device of the character described which will pass by burrs formed on the interior of the pipe or valves in the line.

Yet another object of the invention is the utilization of features of this invention to ascertain the location of the main in the street.

While the subject matter of this invention probably has its greatest applicability to gas mains, it will be obvious as the description proceeds that the invention is equally applicable in any situation where fluid is conducted through a passage, such fluid being either liquid or gaseous or both.

It must be borne in mind that any device for this purpose must prevent the escape of fluid from the service pipe into the building and to this end suitable provision is made, in carrying the invention into effect, to seal the clean-out device while at the same time affording freedom of movement so as to reach any portion of the service pipe.

The invention also resides in details of construction which are practical from the standpoint of ease and cheapness of manufacture and durability and convenience in use.

These and other objects of the invention and the means for their attainment will be more apparent from the following detailed description

taken in connection with the accompanying drawing in which:

Figure 1 is a view in side elevation and partly in section showing the cleaning device of this invention applied to a service pipe for fluid of any description; and

Figures 2, 3 and 4 are longitudinally sectional views showing various cleaning members of this invention.

Figures 5 through 8 show modifications of the said cleaning members.

This application is a divisional of United States application Serial No. 108,607.

Referring first to Figure 1, the service pipe from the gas main is indicated at 12. The fluidway of the T on the inside of the building is indicated at 13-14. The side outlet by which connection is made to the meter is indicated at 15. Normally, the inner end 14 of the T is closed by a removable plug, not shown.

When an obstruction is to be removed in the service line 12, the plug is removed and the device of this invention is inserted.

As shown, a plug 17 of yielding and preferably non-metallic material is formed as a frustum of a cone or at least so that the transverse area at the inner end, that is, that end which enters the fluidway 14, is less than the transverse area at the other end without the T. The plug is formed with a transverse bore and in the interest of durability and particularly where the plug is made of such material as rubber, the ends of the plug are provided with metallic plates 21.

It is contemplated that a cleaning rod indicated in its entirety at 26 shall pass through the bore of the plug into the service line 12 and while the plug 17 when inserted within the fluidway 14 will, because of its yielding character, form a fluid tight joint between the yielding periphery of the plug 17 and the interior surface of the fluidway 14, it is also contemplated, in accordance with this invention, to seal the space between the bore and the rod 26 since the interior diameter of the tube must necessarily be sufficiently greater than the diameter of the bore 24 to permit freedom of movement of the rod 26 therewithin. Conveniently there is carried with the end wall 21 of the plug a stuffing box member 30 which seals the joint and prevents the leakage of fluid from the service main 12.

It has been found convenient, in facilitating the actuation of the rod, to retain the plug 17 in position by a frame or the like which shall have

clamping engagement with the inner end of the pipe 12 or exterior fluidway portion 13 of the T 13-15. To this end, a yoke or the like, 33, is mounted upon the stuffing box and receives the threaded ends of rearwardly extending rods or arms 36, which are pivotally connected, as at 37, with an adjustable clamping frame adapted to engage the cylindrical flange on the fluidway 13, for instance, and is drawn into clamping engagement by the bolts 39 and wing nuts 40, as will be understood. The clamping frame 30-40 then being in fixed position, the plug 17 may be drawn tightly into the fluidway 14 by tightening up on wing nuts 41 on the ends of the rods 36 which thereby draws the annulus 33 and with it the end of the plug of larger diameter toward the T, as will be understood.

The cleaning rod 26 is conveniently formed of sections 43 of suitable diameter as has been hereinbefore explained, which at one end is formed with an interior bore 44 of relatively large diameter terminating in a threaded recess 45 while the opposite end of each section 43 is formed with a cylindrical end 46 of reduced diameter to fit snugly into the bore 44 and with a threaded end 47 for reception in the threaded recess 45. Thus not only are the respective rod sections secured together as by the threaded interconnection but strain on the threaded connection is relieved and angularity of the respective rod sections is prevented and the assembly strengthened by the coaxing telescoping parts 44, 46. Clearly any number of rod sections may be used as is necessary to reach the T at the main.

Assuming now the parts are in the position as shown in Figure 1 and it is desired to locate the T and thereby the main in the street, a tip, such as indicated at 48, may be mounted on the threaded end 47 of the foremost rod section 43. This tip 48 has a relatively blunt chisel point, as shown, and is provided with a threaded recess 49 for the reception of the threaded end 47 of the rod 43. Then when the sectional rod 46 is passed through the stuffing box and plug and into the pipe 12, the free end is guided past any obstruction such as burrs or valve parts until the tip 48 reaches and engages the wall of the T at the main.

If the pipe merely contains some tar, for instance, and rust and any incrustations adhering strongly to the walls, a relatively flexible washer-like member may be used such as is shown in Figure 2, such member being shown as formed of an annular sleeve 50 surrounded with what may be termed a washer or the like 51 of somewhat flexible or semi-rigid material preferably non-metallic such as leather or rubber, which may conveniently be held on the sleeve 50 by outwardly turned flanges 52. Conveniently the peripheral edge of the washer 51 may be rounded, as at 53. Where a stiffer washer is required or can be used, as the case may be, an annular disc 54, of material which can be similar to the disc 51, is held between a pair of annular plates 55 conveniently of metal of suitable gauge secured together in clamping engagement with the member 54 as by rivets or the equivalent 56. Either the disc of Figure 2 or the disc 54, 56 of Figure 1 may be mounted on the threaded end 47 of the foremost rod 43 and retained against the reduced portion 46 by means of the guiding tip 48.

Where water or other liquid is found in the pipe, a cleanout element, such as shown in Figure 3, may be interposed between the tip 48 and the rod portion 46. As shown, a sleeve 58 is adapted to be received on the threaded portion 47 of the

rod. This sleeve has mounted thereon a cup shaped portion 59 conveniently of leather or equivalent material and of a diameter substantially such as to be received within the pipe 12 with ability to pass any burrs or the like on the pipe interior. The cup-shaped portion is formed axially with an aperture 60 which receives the sleeve 58 and annular metallic plates 61 and 62, disposed upon opposite sides of the base portion of the cup 59, are held in clamping engagement with the surfaces surrounding the aperture 60 by means of flanges 64 formed on the sleeve 58. For convenience and durability, the interior of the rim of the cup shaped portion 59 may be bevelled, as shown at 65. When this device is mounted upon the end of the rod 26 and reciprocated along the length of the pipe 12, liquid entrapped therein is either pushed forwardly into the main or pulled rearwardly toward the T 13-15 with a somewhat similar effect to that of a plunger of a suction pump, the flexible wall 59 yielding somewhat to pass inequalities in the interior surface of the pipe 12.

Another instrument whereby water may be expelled from the service line 12 is illustrated in Figure 4. An expansible plug, such as shown in Figure 4, may therefore be resorted to. As shown, two sleeves 68-69 of the same diameter may be utilized. Each sleeve is formed on the remote end with a flange 70. Between these two flanges 70 and encircling the two sleeves 68-69 is an expansible or compressible member conveniently of yielding non-metallic material, such as rubber, illustrated at 71. Conveniently this member is formed with a peripheral groove 72 whereof the sides 73 slope or are bevelled so that from a point 74 relatively near the end of member 71 it decreases progressively in diameter to the midpoint. The interior diameters of the sleeves 68 and 69 are such as to fit on the portion 46 of reduced diameter of the rod section 43, it being held in place by the tip 48. When forced into the pipe to the desired point where the water occurs and the rod then rotated, the tip 43 will be drawn on to the threaded portion 47 thereby causing the two sleeves 68-69 to approach one another to compress the compressible material 71 and cause it to increase in size transversely of the axis of the rod until the yielding non-metallic material engages the interior of the pipe and tightly seals the same and pushes the water with it as the rod advances.

It will be obvious that adhesive may, in some situations, be used in lieu of rivets 56 or sleeves 50 in the Figures 1 and 2 modifications of the disc-like cleaning member. Such a modified structure is shown in Figures 5 and 6. In the Figure 5 showing, the so-called washer 51 is supported to impart a relatively greater degree of stiffness by discs or annuli 75 of a desired diameter and thickness, the apertures 76 therein being such as to receive the threaded end 47 of the rod and are of the same diameter as the aperture 77 in the washer 51. Adhesive or the equivalent secures the parts 51 and 75 together. In the Figure 6 disclosure, the annuli 78 are of smaller diameter but otherwise follow the teaching of the Figures 1, 2 and 5 modifications and like reference characters are affixed.

Figure 7 shows a simplified cup-shaped member 79 wherein annuli 81 are secured by adhesive to the sides of the cup 80.

An instrument similar in purpose to that shown in Figure 4 is illustrated in Figure 8. Here again, the plug 83 is conveniently made of expansible or

compressible material, rubber being a convenient yielding non-metallic material for the purpose. The peripheral groove 72 is shown as somewhat shallower but, the plug being of less overall length, the inclination of the frusto-conical surfaces 73 is about the same. Annuli 84 are adhesively juxtaposed to the ends, respectively, while the diameters of the bore of the plug 83 and of the aperture of the annuli 84 are the same. Obviously, the inclination of the surfaces 73 and the longitudinal and transverse dimensions of the plug as well as the depth of the groove 72 are selected whereby the desired degree of expansion is obtained. In this modification, in order to control the areas that increase in size, a sleeve 85 is inserted within the bore. As the inner diameter of the sleeve 85 must equal the diameter of the bore, the sleeve 85 is embedded in the plug, as shown. The interior diameters of the sleeve 85 and the apertures in the annuli 84 are such as to fit on the portion of the rod of reduced diameter, held in place by the tip 48. When the plug is forced into the pipe to the desired point and the rod rotated, the plug being held sufficiently stationary by its contact with the pipe 12 and the tip being held stationary either by frictional engagement with the plug or by the interengagement of a pin or pins 86 entering recesses 87 in the tip, and the rod then rotated, the tip will be drawn on to the threaded portions thereby causing the two annuli 84, as before, to approach one another to compress the expansible material 83 and cause it to increase in size transversely of the axis of the rod until the yielding non-metallic material engages the interior of the pipe and tightly seals the same and pushes the water with it as the rod advances.

It will thus be seen that a service pipe cleanout device has been provided which serves the purpose of affording a fluid tight joint where it enters the line and is capable of receiving innumerable instruments for removing a variety of obstructions in the interior of the pipe. The rod 26 being in sections can be increased in length so as to reach the end of any service pipe no matter what the distance of the main is from the building. For example, the sections 43 may be of eight foot lengths and may be connected together to extend through a pipe one hundred or one hundred and fifty feet or more in length to remove obstructions or to locate the main in the street. The threaded connection between the rod sections is so designed as to provide a gas tight joint therebetween so no fluid can leak past the stuffing box even during the interval of time that a rod joint is partly within the stuffing box and partly without the same.

Various modifications will occur to those skilled in the art in the composition, configuration and disposition of the component elements going to make up the invention as a whole or in the selection of or combination of desired instrumentalities to accomplish the particular purpose at hand, and no limitation is intended by the phraseology of the foregoing description or illustrations in the accompanying drawing, except as indicated in the appended claims.

What is claimed is:

1. A service pipe clean-out tool comprising an elongated member, a pair of spaced annular compression elements mounted on said member for free rotation thereon, an apertured spool-shaped scraper formed of resilient, non-metallic material mounted on said member between said compression elements, adapted to be held against rotation by frictional engagement with the inner wall of a pipe being cleaned, the end portions of said scraper being of a larger outer diameter than said annular compression elements and presenting circular scraping edges at opposite outer ends thereof, abutment means on said member engaging the outer side of one of said compression elements to maintain the same against longitudinal movement in one direction, additional means threaded on said member and adapted to engage the outer side of the other compression element, said other compression element being in non-rotatable engagement with said scraper and the contacting sides of said additional means and said other compression element being so formed that, upon rotation of said member in one direction, with said scraper frictionally held in said pipe, said additional threaded means will be moved toward said abutment means to exert pressure in opposite directions against the compression elements and against the outer ends of the spool-shaped scraper to expand the same outwardly into scraping engagement with the inner wall of said pipe.

2. A service pipe clean-out tool comprising an elongated member, a pair of spaced annular compression elements mounted on said member for free rotation thereon, an apertured spool-shaped scraper formed of resilient, non-metallic material mounted on said member between said compression elements, adapted to be held against rotation by frictional engagement with the inner wall of a pipe being cleaned, the end portions of said scraper being of a larger outer diameter than said annular compression elements and presenting circular scraping edges at opposite outer ends thereof, abutment means on said member engaging the outer side of one of said compression elements to maintain the same against longitudinal movement in one direction, additional means threaded on said member and adapted to engage the outer side of the other compression element, said other compression element being in non-rotatable engagement with said scraper and the contacting sides of said additional means and said other compression element being so formed that, upon rotation of said member in one direction, with said scraper frictionally held in said pipe, said additional threaded means will be moved toward said abutment means to exert pressure in opposite directions against the compression elements and against the outer ends of the spool-shaped scraper to expand the same outwardly into scraping engagement with the inner wall of said pipe, said spool-shaped scraper having a small sleeve embedded within the interior thereof and encircling said elongated member, said sleeve controlling the areas of said scraper that increase in size.

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